

DT



## UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/802,482	03/16/2004	Ronald N. Perry		4082

7590 11/09/2004

Patent Department  
Mitsubishi Electric Research Laboratories, Inc.  
201 Broadway  
Cambridge, MA 02139

EXAMINER

BRAUTIGAM, ALYSA N

ART UNIT PAPER NUMBER

2676

DATE MAILED: 11/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

DT

<b>Office Action Summary</b>	<b>Application No.</b> 10/802,482	<b>Applicant(s)</b> PERRY ET AL.	
	<b>Examiner</b> Alysa N. Brautigam	<b>Art Unit</b> 2676	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 March 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☒ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-45 is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>5/27/04, 6/28/04</u> | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

→ 7.51

### *Drawings*

1. The drawings are objected to because of the following:

- Figure 7, Item 404 – Appears to be an extraneous item number

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled “Replacement Sheet” in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description:

Art Unit: 2676

- Figure 7, Item 750 – Reference to the item is missing, see paragraph 0132
- Figure 8, Item 800
- Figure 13 – Reference to the figure is missing, see paragraph 0112-0113
- Figure 13, Item 1350 – Reference to item is missing, see paragraphs 0112-0115

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

3. The disclosure is objected to because of the following informalities:

- Page 67, paragraph 0267 – References to "mapping 440" should include reference to Figure 4 to provide coherency
- Page 83, paragraph 0340 – References Item 2020 which is not shown in Figure 20D

Appropriate correction is required.

***Allowable Subject Matter***

4. Claims 1-45 are allowed.
5. The following is an examiner's statement of reasons for allowance:
6. While prior art teaches a method for rendering a region of a distance field representing an object and wherein the distance field is partitioned into a set of cells, prior art fails to teach, alone or in combination, wherein a set of source cells are selected from the set of cells of the distance field to render the region and wherein each source cell in the set of source cells is represented by a geometric element and the geometric element is associated with a texture map, the texture map comprising distance samples of the corresponding source cell. Neither does prior art teach or suggest texture mapping, using the distance samples, each geometric element to determine a distance for each sub-pixel associated with the element.

Friskén et al. ("Adaptively Sampled Distance Fields: A General Representation of Shape for Computer Graphics," SIGGRAPH 2000) discloses a method for rendering (page 252, Section 4.2 discloses the method as applicable to volume rendering) a region of a distance field representing an object, wherein the distance field is partitioned into a set of cells (page 251, Figures 4a-d disclose the object ["R"] partitioned into cells), each cell comprising a set of distance samples (page 249, section 1 - "Introduction", lines 5-7) and a method for reconstructing the distance field within the cell using the distance samples (page 251, section 3.3 - "Reconstructing ADFs", lines 1-2). However,

Art Unit: 2676

Frisken does not disclose wherein each source cell in the set of source cells is represented by a geometric element and the geometric element is associated with a texture map, the texture map comprising distance samples of the corresponding source cell.

Perry et al. ("Kizamu: A System for Sculpting Digital Characters," Proceedings ACM SIGGRAPH 2001, pp 47-56) discloses a method for using Adaptively Sampled Distance Fields, as described in the Frisken paper cited above, for editing and rendering digital images. In particular, Perry discloses several improvements on the techniques including the ability to perform procedural texturing. However, Perry does not disclose wherein a set of source cells are selected from the set of cells of the distance field to render the region and wherein each source cell in the set of source cells is represented by a geometric element and the geometric element is associated with a texture map.

Crawfis et al. ("Texture Splats for 3D Scalar and Vector Field Visualization") discloses a method for texturing using scalar fields as an intensity map. Crawfis further discloses the transformation of the vector field from world coordinates to pixel coordinates and the use of octree volume rendering. However, Crawfis does not disclose the basic components of the claimed method including the rendering of a distance field representing an object wherein the distance field is partitioned into a set of cells, each cell comprising a set of distance samples and a method for reconstructing the distance field within the cell using the distance samples. Neither does Crawfis provide any suggestion to combine the disclosed method with the methods disclosed by Perry or Frisken.

Art Unit: 2676

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### **Conclusion**

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

8. This application is in condition for allowance except for the following formal matters: The objections to the Specification and Drawings as recited in paragraphs 1-3 hereinabove.

Prosecution on the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

A shortened statutory period for reply to this action is set to expire **TWO MONTHS** from the mailing date of this letter.


9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alysa N. Brautigam whose telephone number is 703-305-8631. The examiner can normally be reached on 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella can be reached on 703-308-6829. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2676

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

anb

A handwritten signature in black ink, reading "Matthew C. Bella". The signature is fluid and cursive, with the first name "Matthew" being more prominent than the last name "Bella".

MATTHEW C. BELLA  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600